

REMARKS/ARGUMENTS

Claims 1-24, 67 and 82-85 are presently pending in this application.

Claims 19-24, 67, 84 and 85 have been allowed.

Claims 25-65 and 70-81 were previously withdrawn from consideration in this application in response to an earlier restriction requirement. Applicant reserves the right to file one or more continuation or divisional application(s) related to subject matter of these claims.

Claims 1, 3-11, 15-19, 82 and 83 have been amended.

Accordingly, claims 1-24, 67, and 82-85 remain in this application.

The Rejection of Claims 1 and 11 Under 35 U.S.C. §102(b):

Claims 1 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by Hokuyo, et al. (U.S. Patent 4,177,477 – hereinafter “Hokuyo”).

Claim 1 of the present application, as amended, recites a semiconductor device with a thyristor formed in a layer of semiconductor material. Leakage species are disposed in a region of the semiconductor material that expands across at least one of the base-emitter junction regions for the thyristor while remaining substantially clear of the base-to-base junction region. Applicants submit that this structure for the semiconductor device as recited in Claim 1 is distinguishable from Hokuyo, and further, that one of ordinary skill in the art would find no disclosure or suggestion from the teachings of Hokuyo leading to the features of the present invention as recited in Claim 1.

Hokuyo appears to teach of a power-switching device comprising a thyristor of a vertical NPNP semiconductor arrangement. Applicants further submit that Hokuyo teaches bombardment with irradiation species to produce recombination centers across an entirety (“remaining portion”) of the semiconductor material and use of gold heavy metal dopant species through an entirety of the stack in the vicinity of a “gate” region to the switching thyristor. See, for example, Column 2, Lines 59-64 of Hokuyo referencing FIG. 1 thereof.

Accordingly, applicants submit that Hokuyo does not expressly or implicitly teach or suggest the disposition of leakage species across at least one of the base-emitter junction regions for the thyristor while remaining substantially clear of the base-to-base junction region, as presently recited in Claim 1. Indeed, applicants submit that the teachings of Hokuyo teach away from the features of the present invention as recited in Claim 1.

Hokuyo Teaches Away From the Claimed Invention.

Applicants respectively note that Hokuyo discusses a high turn-on mode for a thyristor of high current concentration operability in vicinity 11 around a gate portion 13, which region may be associated with relatively higher temperature operative affects. Hokuyo seems to teach overcoming an instability problem by doping portion 11 with gold dopant through the entirety of the thyristor stack, which is to be associated with high-current density for the switching device. See, for example, Col. 3, Lines 9-25 and Col. 2, Lines 7-10. The portion for high current density is to be metal doped for a short carrier lifetime throughout the entirety of the stack. In contrast, the present invention as recited in Claim 1 recites leakage species across at least one of the base-emitter junction regions for the thyristor while remaining substantially clear of the base-to-base junction region.

Accordingly, applicants submit that Claim 1 of the present invention is patentable over Hokuyo.

Similarly, independent Claim 11 of the present application recites a thyristor-based memory device comprising a thyristor formed in semiconductor material with anode/cathode, cathode/anode, and first and second base regions disposed between the anode/cathode and cathode/anode regions. Base-emitter junction regions are defined respectively between the anode/cathode and the first base regions and between the cathode/anode and the second base regions. A base-to-base junction region is defined between the first and the second base regions. Lifetime adjustment defects are disposed within a region of the semiconductor material that includes at least a portion of the

depletion region of the first base-emitter junction region while remaining substantially clear of the base-to-base junction region.

Similarly as presented before relative to Claim 1, applicants submit that Hokuyo does not disclose or suggest the features of the present invention as recited in Claim 11, including, provision of lifetime adjusting defects across the base-emitter junction region while remaining substantially clear of the base-to-base junction region.

Further, applicants respectfully submit that an artisan of the field of thyristor-based memory devices would not necessarily be led to the art of power-switching circuits for seeking improvements therefore. The purpose of Hokuyo seems to be directed to obtaining an ability to control high-current levels. It is not clear that an ordinary artisan in the field of semiconductor memory devices (generally focused on low current levels and low voltage levels) would give serious study to the Hokuyo teachings, which seem to be directed to achieving high current density. And as presented earlier herein, even should an artisan closely study Hokuyo, applicants submit that the teaching thereof would not suggest modification thereof for leading to a thyristor-based memory device as now recited in independent Claim 11. Indeed, applicants submit that an artisan may find the teachings of Hokuyo suggesting away from features of the presently claimed invention. Accordingly, applicants submit that Claim 11 is patentable over Hokuyo for reasons similar to those previously presented relative to Claim 1, and further, independently of Claim 1 in considerations of its own specific features as directed to a thyristor-based memory device.

The Rejection of Claims 2-10, 12-18, 82 and 83 Under 35 U.S.C. §103(a):

Claims 2-10, 12-18, 82 and 83 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hokuyo in view of Varker et al (U.S. Registration H569 – hereinafter “Varker”). Applicants respectfully submit that Varker lends nothing further to the disclosure of Hokuyo for anticipating or suggesting the features of the present invention as recited in the pending claims, and accordingly traverse this rejection. Even when assuming that the Examiner may be correct in interpreting Varker to teach carbon as a leakage species, applicants would still submit that an artisan would find Varker to fall-

short of suggesting a modification of Hokuyo for anticipating or suggesting the features of the present invention as recited in claim 2 and/or claim 12.

Accordingly, it is submitted that dependent Claim 2 directed to the semiconductor device and dependent Claim 12 directed to the thyristor-base memory device are patentable over Varker and Hokuyo either singly or taken together. Likewise, it follows that associated dependent Claims 3-10 also are also patentable at least for reasons of being dependent upon a patentable base Claim 2, and that associated dependent Claims 13-16 similarly would be patentable at least for reasons of being dependent upon a patentable base Claim 12.

In view of the above amendments and remarks, applicants urge the allowance of Claims 1-24, 67, and 82-85, and respectfully request such action for this case.

Applicants encourage the Examiner to contact the undersigned should the Examiner wish to discuss this application or amendment.

Respectfully submitted,

FIELDS IP, P.S.

A handwritten signature in black ink, appearing to read 'Walter D. Fields', is written over a horizontal line.

Walter D. Fields
Reg. No. 37,130

Fields IP, P.S.
601 Main Street, Suite 405
Vancouver, WA 98660-3414

Tel.: 360-750-9936
Fax: 360-838-0144